



*Common sense tips and suggestions
for quality woodworkers,
cabinet makers,
furniture manufacturers, and
anyone who uses hardwood plywood!*



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Preventing Checking and Warping in Wood Veneered Panels

Properly manufactured wood products sometimes develop moisture-related problems after leaving the factory. In some instances, the problems do not appear until after the product has been in service as a component in a piece of furniture, cabinet, or other wood article. To control such problems, it is essential to avoid exposure of these products to extremes in humidity and temperature over all stages of the product life cycle, including shipping, storage, secondary processing, and use. Wood veneered panels, in particular, are sensitive to moisture extremes and may develop face veneer checking and/or warping if not cared for correctly.

The moisture level in wood fluctuates depending on the relative humidity and temperature to which it is exposed. Extreme weather and seasonal climatic changes have the potential to cause changes in wood moisture levels of sufficient magnitude and duration to cause problems. Wood tends to expand as it gains moisture and to contract as moisture is lost. Expansion and contraction both create stresses within wood. Thus, extremes in moisture exposures can create excessive stresses in wood veneered panels and cause face veneer checks and/or panel warpage.

These basic steps are recommended to help prevent checking and warping in wood veneered panels:

1. During transit, cover the shipment to protect it from excessive moisture.
2. In storage, protect panels from the elements and extremes in relative humidity and temperature.
3. In processing, maintain relative humidity and temperature in a range that is compatible with the expected conditions in the service environment, using climate control systems if necessary.
4. Apply a finish coating that will help retard moisture movement in and out of the panel, reducing the impact of any drastic, sudden humidity and/or temperature changes. Finishing both panel surfaces will also serve to maintain the moisture balance, which helps to minimize warpage. When applying finishes, avoid over saturation of the panel surface.
5. In the service environment, use climate control systems if necessary to maintain the relative humidity and temperature within the appropriate ranges as indicated below¹:

Most areas of the United States:	30 — 55% R.H.
Dry Southwestern U.S.:	20 — 50% R.H.
Damp, warm Eastern U.S. coastal areas:	40 — 70% R.H.

Temperature should be maintained within a range of 60 — 90°F. As another important precaution, do not put wood items too near or directly facing air vents or radiant heat sources. Conditions in these areas may be at extremes that will cause nearby wood products to become either overly dry or overly moist.

¹Based on U.S.D.A. Wood Handbook 72